



United States Department of Agriculture
Office of the Chief Economist
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April 6, 2015

Mr. Richard Keigwin
Director, Pesticide Re-evaluation Division
Environmental Protection Agency
1200 Pennsylvania Ave. N.W.
Washington, D.C. 20460-0001

Re: USDA Public Comments on the EPA's *Benefits of Neonicotinoid Seed Treatments to Soybean Production* document published in the October 22, 2014 Federal Register; EPA docket identification (ID) number EPA-HQ-OPP-2014-0737.

Dear Mr. Keigwin:

America's farmers face numerous challenges as they work to produce the food, feed, and fiber for a strong and healthy America. On October 22, 2014, EPA added an additional and unnecessary burden by publishing a portion of an incomplete risk assessment titled "*Benefits of Neonicotinoid Seed Treatments to Soybean Production*" which again puts growers in the position of defending their pest management decisions. USDA staff had specifically requested EPA to complete the full risk assessment that would more robustly describe the benefits of neonicotinoid seed treatment for all crops. Instead, EPA released the report regarding soybean seed treatment without additional consideration of other crops or to USDA cautions about releasing a premature assessment of the costs and benefits of such seed treatments. EPA's release of the incomplete report has resulted in a plethora of articles which cast doubt on the value of seed treatment and neonicotinoids for agricultural production and the choices made by farmers. EPA's report indicates that most neonicotinoid seed treatments were prophylactic in nature and that there are available alternative foliar insecticide treatments that would be as effective at similar cost to neonicotinoid seed treatments. EPA concludes that there "... are no clear or consistent economic benefits of neonicotinoid seed treatments in soybeans."

As a whole, USDA disagrees with that assessment. We believe that pest management strategies are made in consideration of pest pressures, climate, landscape, and numerous other factors.

Growers should have the ability to use the best tools available to manage pests that include choices in seed treatment and pest management tactics. Each knows best what works for his or her individual situation.

Again, thank you for the opportunity to review. Our comments are below.

Sincerely,

A handwritten signature in blue ink, appearing to read "Robert Johansson", with a long horizontal flourish extending to the right.

Robert Johansson
Acting Chief Economist

USDA Public Comments on the EPA Document

“Benefits of Neonicotinoid Seed Treatments to Soybean Production”

Background

It is clear that the soybean crop is of significant size and importance to overall US production. In 2013, US farmers harvested 3.36 billion bushels of soybeans on 76.25 million acres, which was valued at \$41.84 billion. Average soybean yield was 44 bushels per acre. In 2013, soybean price at the farm averaged \$14.30 per bushel.

It is also clear that expenditures on neonicotinoid seed treatment for soybeans are substantial and not insignificant. In 2013 neonicotinoid seed treatment sales exceeded \$1 billion and more than \$400 million for soybean seed treatments, or roughly 9 percent of seed costs. There are at least 36 different EPA registered neonicotinoid-based products for seed treatments in soybean. Many of those products are also registered in 40 or more States in addition to the federal registration.

The agricultural sector, including the soybean sector, is typically viewed as competitive. As such it is unlikely that most farmers would be purchasing seed treatments if there was no value to them. For example, extension agents at the University of Mississippi point out that adoption of neonicotinoid seed treatments for soybeans in MS has risen from 2 percent in 2007 to 90 percent today. That pace is more rapid than adoption of herbicide resistant soybeans¹ and has been driven by the value MS soybean producers place on the protections afforded by neonicotinoid seed treatments.²

EPA Findings

EPA argues that it would be equally cost-effective for producers to substitute protections afforded by neonicotinoid seed treatments with other foliar applications of pesticides. The report makes the broad generalization that “...At most, the benefits to soybean growers from using neonicotinoid treated seeds are estimated to be 1. 7% of net operating revenue in comparison to soybean growers using foliar insecticide...”

To come to that conclusion, EPA has had to make several broad generalizations and to rely on scarce and limited data that are not public. For example, EPA assumes that foliar spraying of pesticides is done by all producers who are purchasing seed treatments, that such spraying does not incur additional costs in management or equipment purchases, and that such spraying can address the same pests over the same time window as seed treatments. EPA did not consider any potential environmental consequences of foliar spraying such as compaction issues with farm fields if additional treatments are required, increased risk of exceeding food tolerance residue levels when compared to seed treatments, effects of increased foliar sprays to farm workers, pollinators, other beneficial arthropods or integrated pest management systems, nor regulatory barriers to spraying created by other environmental regulations. The EPA analysis assumes that foliar spraying is environmentally preferable to using seed treatments.

¹ See discussion at <http://www.ers.usda.gov/data-products/adoption-of-genetically-engineered-crops-in-the-us/recent-trends-in-ge-adoption.aspx>.

² See <http://www.mississippi-crops.com/2014/10/31/do-neonicotinoid-seed-treatments-have-value-regionally-in-soybeans/>.

EPA notes some additional limitations in their report, which they indicate may affect their conclusions:

- EPA acknowledges that there may be risk management benefits to using neonicotinoid seed treatments, but that they lack information to quantify those benefits.
- EPA acknowledges that neonicotinoid seed treatments may be more or less valuable to soybean producers in conjunction with other crop management technologies, such as IPM or crop residue management. EPA has not included any of those cross effects in their analysis.
- EPA acknowledges that the use of neonicotinoid seed treatment may help soybean producers manage pesticide resistance. The efficacy of alternatives to neonicotinoid seed treatments are not adjusted for such resistance issues.
- EPA also acknowledges that other costs of soybean production not accounted for in this analysis may influence the extent that uncertainty in EPA's analysis would affect the conclusions.

Conclusion

USDA disagrees with the general assertion by EPA that there are “no clear” economic benefits to seed treatments in soybeans. In 2013 neonicotinoid seed treatment sales exceeded \$1 billion and more than \$400 million for soybean seed treatments. In general, USDA would suggest that farmers are efficient and would not use management practices that did not generate expected benefits that were at least as great as the cost of that management practice. Farmers will generally employ such practices to the point when the marginal benefit of that practice is equal to the marginal cost of that practice. In this case, employing a menu of pesticide practices that includes seed treatments is balanced against the costs of using those practices.

Because, those decisions are based on expected crop prices and expectation that in some years pest management will be more or less necessary based on environmental conditions it may be that in any given year costs of pest management exceed the benefit provided in that year. However in other years such investments are repaid and would cover previous year's use of those practices. Similarly, pest management in one region may protect crops from certain pests at a different rate than in other regions. Given the pace of adoption of neonicotinoid seed treatments particularly in some regions of the country, it is clear that there are economic benefits to using those seed treatments.

Unfortunately, EPA's conclusions are not supported by complete data nor analysis. EPA's analysis does not include potential labor and management savings afforded by seed treatments. Moreover, it does not consider cases when timely foliar applications are not possible or as effective due to general field and weather conditions. Applications of pesticides are required to mitigate the adverse effect of those pests on a newly emergent crop. EPA's calculation does not include consideration of control for soil pests that would not be affected by foliar applications. EPA's calculation does not include any additional regulatory expenditure by landowners, such as costs to revise pesticide permit applications, or costs to submit new applications for foliar spraying. EPA does not consider the benefits of seed treatments when soybeans are grown in rotation with other crops, such as corn, which may be higher than consideration of benefits on a year by year and crop by crop basis. Under a reasonable sensitivity analysis it can be shown that EPA's calculations could be understated by more than a factor of 10 for soybean producers in certain regions.

USDA is disappointed that EPA published this report in such a preliminary format without offering USDA an opportunity to help EPA reframe their analysis and correct the misrepresentation of economic costs and benefits that underlie this report. Farming is different from running a dry cleaning enterprise or an electrical utility. It is the nature of farming that production conditions are uncertain and variable. Producers have to employ a variety of processes and technologies that are best suited to a particular farm, farm family, and environmental condition. As such it is inappropriate to draw conclusions about the entirety of soybean production across regions of the United States under different environmental conditions by simply looking at national averages over several years.

Seed treatments are a preventative measure that guard against yield losses due to certain pests in certain years in certain places. Because farmers have shown rapid adoption of that management technology in some states it is clear that there is value to those treatments. Seed treatments are just one of the tools a producer has to manage pests on the farm. USDA agrees that in some situations different pesticide methods may be equally effective as seed treatments in a given year. And it is likely that in some soybean growing regions, there are more cost-effective pest management treatments. However, in other situations or regions, environmental conditions would likely favor the efficacy of seed treatments over those afforded by foliar spraying.

For many regions, it is generally agreed in the soybean IPM research community that use of neonicotinoid insecticides may not be useful in enhancing yield in soybean, especially for aphid control since it does not persist to the period when aphids are most damaging to yield. However, yield enhancement is not the only consideration for using neonicotinoids in crop production, including in soybeans. Those insecticides may have benefits in soybeans to help produce seed without mottling by reducing virus transmission by beetles, especially around edges of fields. Seed producers get “docked” for mottled seed.

Environmental or ecological consequences of neonicotinoids may not be as great as other traditional insecticidal insect control, especially with regard to unintended mortality of beneficial insects since, in soybeans, it does not persist to the period when most beneficial insects are most active.

Based on the above points, soybean is not a good model for judging the value of neonicotinoids to yield enhancements. Pesticides are considered in production systems as a whole and all crops in that system are generally included. The soybean belt has rotations with corn and soybeans included and neonicotinoids are used in corn as well. Soybeans are now a big part of the production systems in the cotton belt where neonicotinoids have been found to be effective in enhancing cotton yields. Integrated systems rely on every tool available and assessments of any component in the system should include all other possible components.

Because of the many limitations and uncertainties acknowledged by EPA, USDA suggests that EPA revise their study to evaluate the full costs and benefits of neonicotinoid seed treatments in all crops and regions. Furthermore, because EPA has relied on data currently unavailable to the public, USDA requests that EPA include more survey results from the recently released reports that indicate that farmers are using neonicotinoid seed treatments for a variety of reasons.³

³ See recent studies on this topic published by AgInformatics (<http://growingmatters.org/studies/>).
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Specific Comments

1. USDA suggests EPA reframe their analysis to consider the full costs or benefits of neonicotinoid seed treatments as it would typically do under its FIFRA requirements.

When considering pesticide uses under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), EPA provides a benefit assessment in conjunction with a risk assessment and other materials that inform the determination of whether the use of a pesticide results in unreasonable adverse effects on the environment. Consideration of benefits is required during EPA's decision-making process. During registration, registration review or when considering cancellation of a pesticide, USDA and the public receive the entire set of documents relevant to the Administrator's determination of unreasonable adverse effects on the environment.

In cases where the Administrator proposes cancellation of a product or proposes a regulatory action, the Secretary is provided the relevant documents prior to the interagency review with the option to provide formal comments to be included in the Federal Register notice when the regulatory action is published in the Federal Register. All of the neonicotinoid pesticides are currently undergoing registration review with data generation projected to be completed by 2015 for imidacloprid; 2016 for thiomethoxam, clothianidin, and dinotefuran; and 2017 for acetamiprid and thiacloprid. Risk management decisions are to follow in 2016 to 2019. Normally the benefits assessment for specific uses would not be released to the public prior to the interim risk management decision. For example, the interim decision and benefits assessment for flutolanil was released in September while the pesticide was in the last stages of registration review and a full six months following the release of its human health risk assessment in March. In the case of neonicotinoid seed treatments, USDA and the public will see only the soybean neonicotinoid seed treatment benefits assessment without a risk assessment or notice of the decision under consideration. Soybean seed treatment is singled out among all of the neonicotinoid seed treatments, without explanation, creating uncertainty among growers and seed providers over the future of this tool.

2. The potential change in use for neonicotinoid seed treatments assumed in EPA's analysis is economically significant

Because the value of these treatments are in excess of \$1 billion in sales for the US, any analysis of the costs and benefits of using neonicotinoid seed treatments would be considered economically significant and would undergo full notice and comment by OMB and USDA before public comments were solicited.

Even when limiting the scope to soybean seed treatments, the sales of neonicotinoid treatments exceeded \$400 million in 2013, likely making any economic analysis of restricting the use of those treatments economically significant. If EPA recommended cancellation of soybean seed treatments, the Secretary would be asked to comment on EPA's analysis of the impacts on the agricultural economy. As such, USDA suggests that EPA consider the costs and benefits of neonicotinoid seed treatments per the guidance provided by OMB Circular A-4 and the OMB Information Quality Guidelines. Such analysis would explore the many limitations noted in this study and would also examine the efficient use of pest management systems across crop species and regions while considering potential resistance issues.

3. The report does not consider the environmental benefits of neonicotinoid seed treatments for soybeans.

In general, EPA analysis would consider both the costs and benefits of a particular use of a pesticide in question. Despite the title of this report, EPA does not consider any environmental benefits in this analysis. Using seed treatments minimizes the exposure of non-target insect populations to active ingredients included in foliar sprays. Such potential benefits to those insect populations have not been included in this analysis.

Several reports recently have noted the positive environmental benefits associated with seed treatments. For example, the AgInformatics Value Report (2014) indicates that soybean producers that choose to use neonicotinoid seed treatments say that family and worker safety (70%), protecting water quality (57.5%), and protecting beneficial insects (43.8%) are ‘very important’ considerations when selecting pest management strategies. And extension agents at the University of Mississippi note, “...Neonicotinoids are a class of chemistry that are highly efficacious against insect pests and very safe to mammals. This has led to increased use in many crops grown in the Midsouth region...”

4. Preventative seed treatments are likely to be more or less effective under certain conditions and regions.

Most management techniques for growing crops work better in some years than others. For example, during a period of low precipitation it is more useful to irrigate your crop. In other periods, the investment in irrigation technology may not show an economic return. That is also the case with seed treatments. In some years in some regions, neonicotinoid seed treatment may prevent significant yield losses; whereas in others it may not be as beneficial. In some of those instances, the producers may not be able to effectively use foliar sprays as an alternative. That could be due to a number of reasons, such as lack of appropriate conditions for spraying foliar sprays. In addition, common pests are found in both corn-bean rotations. Controlling pests during the soybean rotation may provide benefits for the corn rotation. It does not appear that EPA has considered those potential benefits.

Some foliar pests cannot be effectively controlled with foliar sprays for a period at the beginning of the plant cycle; e.g., germination. Extension agents at the University of Tennessee indicate that seed treatments are most effective in the 3-4 weeks at the beginning of crop growth, which is the critical period for protecting seedlings when they are most vulnerable to pests. Early in the season, it is often the case that fields are wet and therefore difficult for producers to get out into the fields for foliar pesticide applications. In addition, some pests may be below ground and therefore not controlled by foliar sprays.

EPA does not consider protection from the wide range of pests that are controlled by neonicotinoid seed treatments, but simply focuses on three. Other pests often do not cause significant damage to seedlings, but some may: weevils, trochanter mealybug, grape colaspis, wireworms, three-cornered alfalfa hopper, bean leaf beetle, thrips, white-fringed beetles, etc. Indeed, EPA notes that “... In instances where seed treatments may provide some insurance benefit against unpredictable outbreaks of sporadic pests, such as seed maggots or three cornered alfalfa hoppers, BEAD cannot quantify benefits with currently available information. However,

this insurance benefit may exist for some growers, particularly those in the Southern U.S. Given currently available information, BEAD projects that any such benefits are not likely to be large or widespread, given the negligible historical pesticide usage targeting these pests in soybeans....”

5. Seed treatments minimize the management and labor investment required for scouting and foliar spraying.

It does not appear that EPA has considered the time and labor savings afforded producers by use of seed treatments. EPA assumes that all producers are already applying foliar sprays and so the addition of active ingredients to address the same pest spectrum does not come at any cost other than the actual ingredients. However, not all soybean producers apply foliar sprays and those that do may not be applying them at the same time as covered by the seed treatment window of pest control.⁴

6. EPA’s use of limited data to support their analysis is unfortunate, when they were aware that several other studies on this topic would be released at roughly the same time. Those additional data could have been used to augment the limited data cited by EPA in their report.

EPA’s use of unpublished and sparse data to make overly broad conclusions about the efficacy and economic value of neonicotinoid seed treatments does not comport with OMB’s Information Quality Guidelines or EPA’s Guidelines for Ensuring and Maximizing the Quality, Objectivity, Utility, and Integrity of Information Disseminated by the Environmental Protection Agency. As an example, EPA states “when asked when growers should use neonicotinoid seed treatments, 11 of 20 respondents indicated that they should be used under specific conditions – for example, when planting soybean in an area experiencing high infestation rates, or in double cropping scenarios or when planting early season soybeans. Compare that to the AgInformatics Value Report that shows soybean farmers select insecticidal treatments (seed versus foliar) based on cost, consistency of yield and duration of protective effects. The AgInformatics Value Report included 622 soybean farmers from 14 States.

7. EPA’s Table 4 should show sensitivity analysis as is standard practice for cost benefit analysis.

EPA derives their conclusion that neonicotinoid seed treatments do not provide any significant benefits from their calculations in Table 4. EPA describes that table as providing conservative results. USDA would disagree. EPA has not considered many things that would affect those calculations. Indeed, it seems that EPA agrees and acknowledges many of those limitations,

- EPA acknowledges that there may be risk management benefits to using neonicotinoid seed treatments, but that they lack information to quantify those benefits.

⁴ See discussion at <https://www.pioneer.com/home/site/us/template.CONTENT/agronomy/crop-management/high-yield-management/soybean-aphids/guid.069BE58A-CCEA-CE6C-A77D-3E5B02A320EB> and http://www.farmdoc.illinois.edu/manage/newsletters/fefo04_04/fefo04_04.pdf.

- EPA acknowledges that neonicotinoid seed treatments may be more or less valuable to soybean producers in conjunction with other crop management technologies, such as IPM or crop residue management. EPA has not included any of those cross effects in their analysis.
- EPA acknowledges that the use of neonicotinoid seed treatment may help soybean producers manage pesticide resistance. The efficacy of alternatives to neonicotinoid seed treatments are not adjusted for such resistance issues.
- EPA also acknowledges that other costs of soybean production are not accounted for in this analysis may influence the extent that uncertainty in EPA's analysis would affect the conclusions. For example, foliar applications of pesticides often require landowners to apply for pesticide application permits and to undertake more burdensome pesticide applications precautions. Such additional regulatory costs are costly to producers and have not been included in this analysis.

Those limitations further calls into question the overly broad conclusions EPA has published. By considering some reasonable alternatives to EPA's limited comparison, USDA notes that seed treatments could be very beneficial to producers under certain conditions that are unknown to a producer at planting time (see table below).

Revenue and Cost	Units	EPA Assumptions		Sensitivity Analysis			
		Seed Treatment	Alt. 1	Alt. 2	Alt. 3	Alt. 4	
Yield	(bu/ac)	45	45	45	45	38	
Other pests	(bu/ac)				-1	-1	
Price	(\$/bu)	\$12.03	\$12.03	\$12.03	\$12.03	\$9.59	
Gross revenue	(\$/ac)	\$536	\$536	\$536	\$529	\$355	
Insecticide costs	(\$/ac)						
Seed treatment	(\$/ac)	\$8					
Foliar spray	(\$/ac)		\$14	\$14	\$14	\$14	
Labor & Mgmt	(\$/ac)		\$0	\$7	\$7	\$7	
Other variable costs	(\$/ac)	\$173	\$173	\$173	\$173	\$173	
Total variable costs	(\$/ac)	\$180	\$186	\$194	\$194	\$194	
Net operating revenue	(\$/ac)	\$356	\$350	\$343	\$336	\$161	
Percent difference	(%)		1.69%	3.79%	4.05%	41.76%	

- Alternative 1: EPA assumptions: yield protection of foliar sprays is equal to seed treatment; no additional costs of pesticide treatments for labor and management or scouting. Assumes flubendiamide is the active ingredient in foliar spray. Requires 2 gallons of water per acre for aerial application and 10 gallons per acre for ground application. A recent California study of various emusifiable concentrations estimated the per acre cost of aerially applying flubendiamide at 2.0 fl. oz at \$22.10 per acre. Flubendiamide is used in soybeans at 2 – 3 fl. oz per acre.
- Alternative 2: Includes a cost of applying foliar pesticides range from \$6 to \$25 based on prices quoted in Soybean Business, a magazine for Minnesota growers. See also Johnson, K.D., et al. (2009) "Probability of Cost-Effective Management of Soybean Aphid

(Hemiptera: Aphididae) in North America,” *Journal of Economic Entomology* 102(6): 2101 – 2108.

- Alternative 3: Considers the case that foliar sprays do not control for potential soil pests or that the optimal time to apply pesticides are not available due to field or environmental conditions. As such, the yield benefits afforded by foliar sprays are assumed to be 1 bu/ac less than those provided by seed treatments.
- Alternative 4: Same as alternative 3, but in a region where the yields are lower than the national average (e.g., Mississippi soybean yield in 2009 was 38 bu/ac and the national yield was 44 bu/ac) in a year with low prices (e.g., average price received by farmers in 2009 for soybeans was \$9.59 per bu).